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Filed : August 22, 2003

## REMARKS

Claims 1-22, 27 and 33-37 stand rejected under 35 U.S.C. §112, first and second paragraphs, as discussed below. Claim 1 has been amended to recite that treating the protein modifies the protein conformation. Support for this amendment can be found, for example, in Paragraphs [0035], [0048], [0066] and [0080] of the specification, as published. Claim 1 has also been amended to recite that enhancement of the treated protein is indicated by at least one of increased emulsion capacity (EC) and increased emulsion stability (ES). Support for this amendment can be found, for example, in Paragraph [0034] of the specification, as published. Claim 16 is amended to depend from claim 15 in order to provide proper antecedent basis. New Claim 38 is added and is fully supported by the specification as filed. Claims 14 and 28-32 are canceled. Claim 14 is canceled to remove redundancy in the claims, and claims 28-32 are canceled in view of the previous restriction requirement. No new matter is added by any of these amendments

### Claim rejections under 35 U.S.C. §112, First Paragraph, Enablement

The claims were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. The Examiner asserted that Applicant did not clearly teach what is encompassed by “treating” or “enhancing”, and that the use of these phrases does not clearly identify that which is being claimed. Applicant respectfully submits that the phrases are not recited in claims 33-37 and therefore, the rejection is not applicable to those claims. Furthermore, with respect to the remaining claims Applicant respectfully disagrees and asserts that the specification clearly enables “treating” and “enhancing” as recited in the claims. In addition, Claim 1 has been amended to clarify what is being claimed.

### *Treatment of the protein*

In regard to the recitation of “treating”, the specification identifies many embodiments of how proteins may be treated.

For example, in some embodiments, the system pH, temperature, pressure and/or overall ionic strength can be adjusted to enhance the ability of the protein to emulsify fat. See, for example, Paragraph [0035]. The identity of the ionic species can be manipulated, for example, through ion exchange. See again, Paragraph [0035].

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In some embodiments, the proteins are treated with enzymes. In one exemplary embodiment, the proteins can be treated with one or more proteases to cleave the protein into forms that act as superior emulsifiers. See, for example, Paragraph [0035].

The specification also teaches that the proteins can be treated by adjusting the pH of the hydrated protein. The pH can be controlled, for example, by the addition of food grade acids, buffers, and/or alkali agents. See Paragraph [0036]. In exemplary embodiments the pH of the protein solution can be adjusted with agents such as monovalent citrate and/or phosphate buffering salts, including sodium orthophosphate and trisodium citrate salts. See, for example, Paragraphs [0050].

In other embodiments the protein may be treated by manipulating the hydrated protein mixture by adjusting the temperature, pressure, pH, ionic strength and/or ionic composition of the water that is added to the concentrated protein. See, for example, Paragraph [0044] and Figure 1.

The specification teaches that the protein can be treated by adjusting the temperature of the water used for hydrating the protein and exemplary temperatures and temperature ranges for the water are provided. See, for example, Paragraph [0052].

The specification also teaches that the protein can be treated by adjusting the ionic strength and/or ionic composition of the water. For example, monovalent salts are disclosed for the adjustment. See, for example, Paragraph [0053].

In addition, Applicants note that the current amendment to Claim 1 clarifies that treatment modifies the protein conformation.

In view of the multiple embodiments described in the specification and the claims as filed, Applicant submits that one of skill in the art would understand how to carry out the claimed methods, including treatment of the protein. It is therefore respectfully submitted that these claims satisfy the enablement requirement, and Applicant requests withdrawal of the rejection..

Applicants also note that with respect to Claim 15, the claim specifically recites the feature “wherein treating the protein comprises adjusting the ionic composition of the hydrated protein solution”. Applicants thus submit that the term “treating” is clear and enabled. Thus, the rejection of Claim 15 and the claims that depend therefrom should be withdrawn on the basis of this additional ground as well.

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***Enhancement of the protein***

With respect to the recitation of “enhancing”, the specification discloses that proteins are treated to enhance their ability to form an emulsion with fat. Enhancement may be determined by comparing the amount of fat that can be emulsified by untreated proteins relative to the amount that can be emulsified by the same type of proteins that have received the treatment. See, for example, Paragraph [0034].

The specification teaches that measuring the ability of proteins to form an emulsion are well known in the art. In one particular embodiment, the ability can be evaluated as emulsion capacity (EC), which is the volume of oil or fat that is emulsified per gram of protein before phase inversion occurs. In another exemplary embodiment, the ability can be measured by emulsion stability (ES), in which the volume of an initial emulsion is compared to the volume of a final emulsion. The final emulsion volume is measured after the initial emulsion is allowed to stand or is centrifuged for a specified period of time. See Paragraph [0034]. Using these measures of the ability of proteins to form an emulsion, one of ordinary skill in the art would understand that the enhancement of the protein could be evaluated by comparing the relative EC or ES of the untreated protein to that of the treated protein. For example, in one embodiment, the protein treatment is said to increase (or “enhance”) the ability of the protein to emulsify fat if it increases the EC or ES compared to untreated protein.

Thus, the claims are sufficiently enabled by the specification for the claimed feature of “enhancing” the proteins ability to emulsify fat in water. However, without acquiescing in the rejection, Applicant has amended the claims to recite that enhancement of the treated protein is indicated by at least one of increased EC and increased ES. Therefore, in view of the foregoing amendment and remarks, Applicant asserts that the claims meet the enablement requirement and respectfully request the withdrawal of the rejection.

**Claim rejections under 35 U.S.C. §112, Second Paragraph**

The claims were rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter that is regarded as the invention. The Examiner asserted that the use of “treating” and “enhancing” does not clearly set

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forth limits on the claims. Applicant respectfully submits that the phrases are not recited in claims 33-37 and therefore, the rejection does not appear applicable to those claims.

Without acquiescing in the rejection, claim 1 has been amended to recite that that treating the protein modifies the protein conformation to enhance its ability to emulsify fat. In addition, claim 1 has been amended to recite that enhancement of the treated protein is indicated by increased emulsion capacity (EC) or emulsion stability (ES).

In view of the amendment, Applicant respectfully submits that the claims satisfy the requirements of 35 U.S.C. §112, 2<sup>nd</sup> paragraph and request the withdrawal of the rejection.

Allowability of Claims 33-37

As discussed above, the rejections under 35 U.S.C. §112 pertain to the recitation of "treating" and "enhancing" the protein in the claims. Claims 33-37 do not recite these features and therefore, the rejections are not applicable to the claims. Thus, Applicants respectfully submit that these claims are in condition for allowance.

Conclusion

Applicant has endeavored to address each of the Examiner's concerns and submit that the present application is in condition for allowance. If any issues remain, the Examiner is invited to contact Applicant's counsel at the number provided below in order to resolve such issues promptly.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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